

Remarks

Claims 1-13 were originally filed in this application and are subject to a Restriction Requirement. Claims 12-13 have been withdrawn from consideration as being drawn to a non-elected invention. Claims 1, 2, 4-6 and 11 have been amended. Claims 1-11 remain in this application.

Election/Restriction Requirement

Originally filed claims 1-13 were restricted to Group I (claims 1-11) and Group II (claims 12-13). Applicants hereby elect **claims 1-11 (Group I) for examination**. Claims 12-13 are withdrawn from consideration without prejudice or disclaimer as being drawn to a non-elected invention.

The 35 §USC 102 Rejections

Claims 1-11 are rejected under 35 §USC 102(b) as being anticipated by Nakatsuka (Patent Publication No. JP11076769). This rejection is respectfully traversed and reconsideration is requested in view of the foregoing amendments.

Claim 1, as amended, sets forth a step for introducing a chemical cleaning solution into the lumens. Further, a gas is applied at a pressure below the bubble point for progressively displacing at least some of the chemical cleaning solution within the lumens through the membrane pores which results in removal of the solids retained on or in the hollow membranes.

By contrast, Nakatsuka indicates that the use of gas pressurization is separate from the introduction of the chemical solution. In particular, Nakatsuka sets forth that **“at least one point of time before and after the liquid chemical is supplied to the filter membrane module 11 or at the both point of time, a gas pressurizing process for pressurizing a gas from the permeation side of the filter membrane is provided for 1-5 min.”** (see esp@cenet Abstract lines 16-22 – emphasis added). Further, Example 1 in the machine translation of the Nakatsuka document sets forth that the gas pressurization stage lasts for 1 minute and is separate from the chemical washing step (see page 5, lines 1-13 to page 6 lines 1-4 and page 6, lines 44-48).

Therefore, the gas pressurization in Nakatsuka is not used to displace the chemical cleaning solution back through the membrane as set forth in amended claim 1. As such, it is believed that claim 1, and dependent claims 3 – 11 are not anticipated by Nakatsuka. Independent claim 2 includes similar subject matter to that of claim 1. Therefore, it is believed that claim 2 is also not anticipated.

Claims 1-5, 7 and 10-11 are rejected under 35 §USC 102(b) as being anticipated by Ford et al. (US Patent No. 4931186). This rejection is respectfully traversed and reconsideration is requested in view of the foregoing amendments.

As described in relation to the Nakatsuka reference, claim 1, as amended, sets forth a step for introducing a chemical cleaning solution into the lumens. Further, a gas is applied at a pressure below the bubble point for progressively displacing at least some of the chemical cleaning solution within the lumens through the membrane pores which results in removal of the solids retained on or in the hollow membranes.

Ford et al., by contrast, does not disclose the use of a gas to progressively displace a chemical cleaning solution within the lumens through the membrane pores to remove solids. Rather, Ford discloses the use of gas on a clarified liquid (column 6, line 65 to column 7, line 22).

Therefore, it is believed that claims 1-5 and 10 – 11 are not anticipated by Ford. Independent claim 2 includes similar subject matter to that of claim 1. As such, it is believed that claim 2 is also not anticipated.

The 35 §USC 103 Rejection

Claims 6 and 8-9 are rejected under 35 USC 103(a) as being unpatentable over Ford et al. and Nakatsuka. This rejection is respectfully traversed and reconsideration is requested.


As previously described, claim 1, as amended, includes a step for introducing a chemical cleaning solution into the lumens. A gas is then applied at a pressure below the bubble point for progressively displacing at least some of the chemical cleaning solution within the lumens through the membrane pores which results in removal of the solids retained on or in the hollow membranes.

It is indicated in the Office Action that Nakatsuka teaches that the cleaning solution in conjunction with a gas backwash is capable of sufficiently removing an adsorbed material to the filter membrane. However, the gas in Nakatsuka is not used to force the chemical cleaning solution through the membrane to achieve optimum cleaning with minimum chemical consumption. In particular, Nakatsuka merely discloses gas pressurization of the permeate side **either before or after, or both before and after**, the chemical cleaning solution has been circulated on the feed side. In addition, Ford et al. does not even contemplate the use of a chemical cleaning solution in conjunction with gas pressurization.

Neither Nakatsuka nor Ford et al., alone or in combination, suggest Applicant's inventive process where alternating filtration and reverse flow using gas pressure are used to draw a chemical cleaning solution back and forth through the membrane in repeated cycles. Absent such suggestion, there would be no reason why one of ordinary skill in the art, who was faced with the same problems confronting the Applicant and who had no prior knowledge of Applicant's claimed structure, would consult either Nakatsuka or Ford et al. alone or in combination to overcome the problems set forth in the patent application. Claims 6 and 8-9 depend from claim 1. As such, it is believed that claims 6 and 8-9 are not obvious.

Should the Examiner be of the view that an interview would expedite consideration of this Amendment or of the application at large, request is made that the Examiner telephone the applicant's attorney at (732) 321-3193 in order that any outstanding issues be resolved. The undersigned authorizes the charging of any fee deficiency that is due to Deposit Account No. 19-2179.

Respectfully submitted,


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